

**REMARKS**

**Rejections under 35 USC §112, Second Paragraph**

**Claims 13 and 14 were rejected under 35 USC §112, second paragraph, as being indefinite.**

Claims 13 and 14 have been cancelled making the rejection moot.

**Rejections under 35 USC §102(a) and 35 USC §103(a)**

**Claims 1, 3, 4, 6, 15 and 16 were rejected under 35 USC §102(a) as being anticipated by or, in the alternative, under 35 USC §103(a) as being obvious over Hosono et al. (JP2002-003218 and JP2003-238149).**

Applicants respectfully traverse this rejection.

These references show some of the present inventors' earlier inventions. JP2002-003218 discloses  $12\text{CaO}\cdot7\text{Al}_2\text{O}_3$  compound including the active oxygen seed ( $\text{O}_2^-$  ion radical and/or  $\text{O}^-$  ion radical) in a concentration of more than  $1\times10^{18}$ . JP2003-238149 discloses  $12\text{SrO}\cdot7\text{Al}_2\text{O}_3$  compound enclosing the active oxygen species of  $\text{O}_2^-$  ion radical and/or  $\text{O}^-$  ion radical of  $1\times10^{18}$  or more.

However, claims 1, 3, 4, 6, 15 and 16 recites as follows:

1. A  $12\text{CaO}\cdot7\text{Al}_2\text{O}_3$  compound comprising: electrons substituted for free oxygen ions at a concentration of  $1\times10^{18}$  to less than  $1.1\times10^{21}/\text{cm}^3$  out of free oxygen ions contained in cages at a substitution ratio of the electrons to the free oxygen ions of 2 to 1, the concentration of the electrons being  $2\times10^{18}$  to less than  $2.2\times10^{21}/\text{cm}^3$  in the cages, wherein

the electrical conductivity at room temperature is in the range of  $10^4$  S/cm to less than  $10^3$  S/cm."

3. A mixed crystal compound containing  $12\text{CaO}\cdot7\text{Al}_2\text{O}_3$  and  $12\text{SrO}\cdot7\text{Al}_2\text{O}_3$ , comprising: electrons substituted for free oxygen ions at a concentration of  $1\times10^{18}$  to less than  $1.1\times10^{21}/\text{cm}^3$  out of free oxygen ions contained in cages at a substitution ratio of the electrons to the free oxygen ions of 2 to 1, the concentration of the electrons being  $2\times10^{18}$  to less than  $2.2\times10^{21}/\text{cm}^3$  in the cages, wherein the electrical conductivity at room temperature is in the range of  $10^4$  S/cm to less than  $10^3$  S/cm.

4. An electride  $12\text{CaO}\cdot7\text{Al}_2\text{O}_3$  compound comprising: electrons that are substituted for almost all the free oxygen ions contained in cages at a substitution ratio of the electrons (referred to as  $e^-$ ) to the oxygen ions of 2 to 1, the electride  $12\text{CaO}\cdot7\text{Al}_2\text{O}_3$  compound being practically represented by  $[\text{Ca}_{24}\text{Al}_{28}\text{O}_{64}]^{4+}(4e^-)$ .

6. A mixed crystal electride compound containing a  $12\text{CaO}\cdot7\text{Al}_2\text{O}_3$  compound and a  $12\text{SrO}\cdot7\text{Al}_2\text{O}_3$  compound, comprising: electrons that are substituted for almost all the free oxygen ions contained in cages at a substitution ratio of the electrons to the oxygen ions of 2 to 1, the mixed crystal electride compound being practically represented by  $[(\text{Ca}_{1-x}\text{Sr}_x)_{24}\text{Al}_{28}\text{O}_{64}]^{4+}(4e^-)$ .

Thus, these claims recite electrons that are substituted for the free oxygen ions contained in cages. Hosono et al. (JP2002-003218 and JP2003-238149) do not discuss these electrons.

For at least these reasons, claims 1, 3, 4, and 6 patentably distinguish over Hosono et al. Claims 15 and 16, depending from these claims, also patentably distinguish over Hosono et al. for at least the same reasons.

Thus, the 35 USC §102(a) and 103(a) rejection should be withdrawn.

**Rejections under 35 USC §103(a)**

**Claims 2 and 5 were rejected under 35 USC §103(a) as being obvious over Hosono et al. (JP2002-003218 and JP2003-238149) both in view of Yamaguchi et al. (Communication of the American Ceramic Society).**

Applicants respectfully traverse this rejection.

Yamaguchi et al. has been cited for allegedly disclosing  $12\text{SrO}\cdot7\text{Al}_2\text{O}_3$  compound and that it is treated by the same means as  $12\text{CaO}\cdot7\text{Al}_2\text{O}_3$  compound.

Claims 2 and 5 recite as follows:

2. A  $12\text{SrO}\cdot7\text{Al}_2\text{O}_3$  compound comprising: electrons substituted for free oxygen ions at a concentration of  $1\times10^{18}$  to less than  $1.1\times10^{21}/\text{cm}^3$  out of free oxygen ions contained in cages at a substitution ratio of the electrons to the free oxygen ions of 2 to 1, the concentration of the electrons being  $2\times10^{18}$  to less than  $2.2\times10^{21}/\text{cm}^3$  in the cages, wherein the electrical conductivity at room temperature is in the range of  $10^{-4}$  S/cm to less than  $10^3$  S/cm.
5. An electride  $12\text{SrO}\cdot7\text{Al}_2\text{O}_3$  compound comprising: electrons that are substituted for almost all the free oxygen ions contained in cages at a substitution ratio of the electrons to the oxygen ions of 2 to 1, the electride  $12\text{SrO}\cdot7\text{Al}_2\text{O}_3$  compound being practically represented by  $[\text{Sr}_{24}\text{Al}_{28}\text{O}_{64}]^{4+}(4\text{e}^-)$ .

Thus, these claims also recite electrons that are substituted for the free oxygen ions contained in cages. As discussed above, Hosono et al. do not discuss these electrons. Also, alleged disclosure of Yamaguchi et al does not remedy the deficiencies of Hosono et al.

For at least these reasons, claims 2 and 5 patentably distinguish over Hosono et al.

Thus, the 35 USC §103(a) rejection should be withdrawn.

Application No.: 10/561,968  
Art Unit: 1792

Amendment under 37 C.F.R. §1.111  
Attorney Docket No.: 053329

In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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